

PUBLIC HEALTH FACT SHEET

Eastern Encephalitis

Massachusetts Department of Public Health, 150 Tremont Street, Boston, MA 02111, (617) 727-0049, Dr. Bailus Walker Jr., Commissioner

What is Eastern Encephalitis (EE)?

Eastern Encephalitis (EE) is a serious but very rare illness caused by a virus carried by wild birds that live in freshwater swamp areas. The virus is transmitted among the birds by the female of one species of swamp-breeding mosquito not known to bite humans. Normally, the virus remains confined to these birds and mosquitoes, but in occasional years there is spillover of the virus into other species of mosquitoes that may bite humans. It is not currently known how this spillover occurs. The time of highest risk for transmission of the virus to humans is from late July through September. The risk of EE transmission ends after one or two frosts, and the adult mosquitoes involved in the transmission of EE are killed.

What Kind of an Illness is EE?

EE is characterized by swelling of the brain (encephalitis), and has an incubation period of between two and 10 days. Early symptoms include a fever of between 103 and 106 degrees, stiff neck, headache and a feeling of lethargy. The disease progresses rapidly, and many patients are in a coma within a week. Approximately half of these patients die or suffer permanent neurological damage. EE also occurs in horses, but a vaccine has been developed for horses which is highly effective. A person or horse who has contracted EE is not infectious, and someone exposed to a horse or person with EE would not contract the disease.

Where and to What Extent has EE Occurred in Massachusetts?

EE has been an annual concern in the southeastern part of the state around the Hockomock and Pine Swamps of the Taunton River Basin. However, in 1982 two children from Dover and Bedford contracted EE, causing the Department of Public Health (DPH) to step up surveillance efforts in Middlesex County. In 1983, there were no further cases in Middlesex County, but there was a total of six cases in southeastern Massachusetts. In 1984, there was one case (fatal) from southeastern Massachusetts and another in a Framingham child believed to have been infected in New Jersey. There were no cases in 1985. EE appears to occur only in the larger freshwater swamps of eastern Massachusetts. No human or horse cases have been reported west of Worcester or on Cape Cod. From 1938-1985, 65 human cases of EE were reported, but because the cases were clustered in only a few years, there were no cases of EE at all in 38 of these years.

Is the Summer of 1986 Expected to be a Time of Increased Risk for EE?

1986 should be the second year in the current cycle when no case appears. However, reasonable precautions should be taken (see over) because it is not known exactly why EE appears in some years and not in others. There has been a historical multi-year pattern to the disease. Generally, Massachusetts has experienced two to three consecutive years of EE followed by a greater number of years when no cases are observed. 1984 was the third year of the cycle of increased EE activity which began in 1982.

What Does the Department of Public Health Do to Monitor and Prevent EE?

DPH has operated an EE surveillance program since 1957. Beginning in May and continuing until the first frost, a DPH field staff collects mosquitoes once or twice a week from traps at 18 locations throughout eastern Massachusetts. Those locations are: Bedford, Canton, Carver, Easton, Groveland, Halifax, Hanover, Holliston, Lakeville, Littleton, New Bedford, Raynham, Reading, Rehoboth, Walpole, Wenham, Westborough and Westport. Entomologists, specialists in the study of insects, examine overnight catches from traps which are hung in the selected sites. These traps are equipped with small battery-operated lights to attract the mosquitoes. The female mosquitoes are sorted by species and tested at DPH's State Laboratory in Jamaica Plain for the presence of EE virus. DPH issues advisories to local public health officials, hospitals around the state and the general public when there appears to be a risk of EE transmission to humans. If an EE case is suspected, the State Laboratory does the testing to confirm the diagnosis, and the Department's Division of Communicable Diseases provides consultation to local physicians and hospitals.

What Can People Do to Protect Themselves Against EE?

There is no licensed vaccine for general use in humans. To minimize risk, DPH recommends that residents of eastern Massachusetts take the following precautions to protect against EE:

- If you live near or are visiting areas with large freshwater swamps, use mosquito repellent according to label directions and wear long sleeve shirts and long pants, especially at dawn and dusk when mosquitoes are out in the largest numbers.
- Take special care to cover up children who may be playing near swampy areas. Do not leave infants outdoors in uncovered carriages and playpens.
- Avoid overnight camping in freshwater swamp areas.
- Be sure that screens are securely fastened to all doors and windows of your home, and use insecticides according to label directions if you find mosquitoes in your home.
- Eliminate areas of stagnant water around your home where mosquitoes can breed. Examples of such areas include clogged gutters and ditches, old tires, wheelbarrows and children's wading pools.

What About Spraying?

DPH's position on spraying depends on a number of factors. These include the purpose of the spraying (EE control vs. nuisance control), the chemicals used in the spraying and the type of application (ground spraying vs. aerial spraying). DPH's support of spraying occurs only when there is a significant risk of EE transmission to humans, and the endorsement is usually for ground spraying rather than aerial spraying except in truly exceptional circumstances. This is because aerial spraying can only be done safely under certain weather conditions and should only be done when there are an unusually large number of mosquitoes of the type suspected of carrying the EE virus. Also, there is no clear evidence that aerial spraying is more effective than ground spraying in reducing the risk of EE transmission to humans in the type of terrain that Massachusetts has.

How Dangerous is Spraying?

The chemical that is most commonly used to control adult mosquitoes that may be carrying the EE virus is called malathion. Malathion has been used extensively for more than 30 years, and is the most widely applied home and garden insecticide. To date, malathion has not been shown to cause cancer or birth defects in laboratory animals, and has not been reported to cause either in humans. Subtle reproductive effects have been shown in laboratory animals exposed to levels hundreds or thousands of times higher than those to which people are exposed during spraying. Malathion is broken down quickly by sunlight, water and contact with the soil. One-half of the amount applied will break down in the environment in two to four days depending on weather conditions and formulations. As with all chemicals, exposure should be kept to a minimum. Therefore, DPH recommends that residents close all windows and doors and stay inside their homes during spraying operations to minimize any possible health effects of the spray. Spray applicators have been instructed to give residents advance notice of spraying whenever possible.

Where Can I Call for More Information?

Massachusetts Department of Public Health

State Laboratory Institute (617) 522-3700 (For information about mosquito trapping and testing programs, general background information on EE in Massachusetts and consultation to local physicians and hospitals on symptoms and treatment of EE.)

Office of Public Information and Health Education (617) 727-0049

Massachusetts Department of Food and Agriculture

State Reclamation and Mosquito Control Board (617) 727-3035 (For information on regional mosquito control programs carried out under their technical direction.)

Division of Animal Health (617) 727-3015 (For information on horse vaccination.)

Your Local Board of Health

Listed in the telephone book under listings for your municipal government.